

Mahishadal Raj College

Department of BCA

A) Programme Outcomes:-

PO-1: *Computational knowledge:* Apply mathematics and computing fundamental and domain concepts to find out the solution of defined problems and requirements.

PO-2: *Problem Analysis:* Use fundamental principle of Mathematics and Computing to identify, formulate research literature for solving complex problems, and reaching appropriate solutions.

PO-3: *Design/Development of Solutions:* Understand to design, analyze, and develop solutions and evaluate system components or processes to meet specific need for local, regional and global public health, societal, cultural, and environmental systems.

PO-4: *Conduct Investigations of Complex Computing Problems:* Use expertise research-based knowledge and methods including skills for analysis and development of information to reach valid conclusions.

PO-5: *Professional Ethics:* Exhibiting ethics for regulations, responsibilities, and norms in professional computing practices.

PO-6: *Life-long Learning:* Enlighten knowledge to enhance understanding and building research, and strategies in independent learning for continual development as computer applications professional.

PO-7: *Project Management and Finance:* Establishing strategies in developing and implementing ideas in multi- disciplinary environments using computing and management skills as a member or leader in a team.

PO-8: *Communication Efficacy:* Contribute to progressive community and society in comprehending computing activities by writing effective reports, designing documentation, making effective presentation, and understand instructions.

PO-9: *Societal and Environmental Concern:* Apply mathematics and computing knowledge to access and solve issues related to health, safety, societal, environmental, legal, and cultural issues within local, regional and global context.

PO-10: *Individual and Teamwork:* Gain confidence for self and continuous learning to improve knowledge and competence as a member or leader of a team.

B) Programme Specific Outcomes:-

PSO-1: Analyze the abilities in systematic planning, developing, testing, and executing complex computing applications in the field of Social Media and Analytics, Web Application Development, and Data Interpretations.

PSO-2: Explain in-depth expertise and sustainable learning that contributes to multi-disciplinary creativity, permutation, modernization, and study to address global interest.

C) Course Outcomes:-

Semester	Paper Code & Name	Outcomes
1 st	BCA 1101: Computer Fundamentals and application software	<ul style="list-style-type: none"> To familiarize students about the basic fundamental design and building blocks of computer system. Select and implement different software development process models. Define the basic concepts and importance of Software project management concepts like cost estimation, scheduling, and reviewing the progress. Apply different testing and debugging techniques, and analyse their effectiveness. Extract and analyse software requirements specifications for different projects.
	BCA 1102: Programming in “C”	<ul style="list-style-type: none"> Develop problem-solving skills coupled with top down design principles. Learn about the strategies of writing efficient and well-structured computer programs.
	BCA 1103: Discrete Mathematics with application to computer science	<ul style="list-style-type: none"> To impart the required knowledge of Mathematics and statistics for managerial activities among students. To inculcate in students the fundamental mathematical background of computer science. To gain knowledge about Sets, Relations

		<p>Functions, Matrices, Mathematical logic, and Group.</p> <ul style="list-style-type: none"> • Understand the basic concepts of Sets, Relations Functions, Matrices, Mathematical logic, and Group. • Develop analytical ability to solve real-world problems using these methodologies.
	BCA 1104: Digital Electronics	<ul style="list-style-type: none"> • To introduce the fundamentals of computers. • To introduce basic postulates of Boolean algebra and shows the correlation between Boolean expressions. • To outline the formal procedures for the analysis and design of combinational circuits and sequential circuits. • To introduce the concept of computer memories.
	BCA 1195: Communication skill and Language laboratory	<ul style="list-style-type: none"> • Develop the student's ability to use English language accurately and effectively by enhancing their communication skills. • Mastering the art of a professional business presentation. • Distinguish different communication processes and their practical applications. • Enhancing writing skills.
	BCA 1196: C programming Lab	<ul style="list-style-type: none"> • Develop modular programs using control structures, pointers, arrays, strings and structures. • Design and develop solutions to real world problems using C. • Able to develop structured programming approach. • Write, debug, and execute programs using advanced features in C.
	BCA 1197: Digital electronics Lab	<ul style="list-style-type: none"> • To familiarize students with different building components of Integrated circuits. • Ability to understand the logic of different electronic circuits.
2 nd	BCA 1201: Computer Organization and Architecture	<ul style="list-style-type: none"> • To make students understand the basic structure, operation, and characteristics of a computer. • To familiarize the students with hierarchical memory system including

		<p>cache memory and virtual memory.</p> <ul style="list-style-type: none"> • To make students know the different ways of communicating with I/O devices and standard I/O interfaces.
	BCA 1202: Data Structure	<ul style="list-style-type: none"> • To be familiar with fundamental data structures and with the manner in which these data structures can best be implemented; become accustomed to the description of algorithms in both functional and procedural styles. • Ability to choose a data structure to suitably model data used in computer applications. • Ability to assess efficiency trade-offs among different data structure implementations.
	BCA 1203: Mathematical foundation for computer science	<ul style="list-style-type: none"> • Understand the notion of mathematical thinking, mathematical proofs, and algorithmic thinking and be able to apply them in problem solving. • Understand the basics of combinations, and be able to apply the methods from these subjects in problem solving. • Understand the basic properties of graphs and related discrete structures, and be able to relate these to practical examples.
	BCA 1204: Financial and Management Accounting	<ul style="list-style-type: none"> • To understand the basics of accounting and its application in general business environment. • To get the Knowledge about the important concepts and characteristics of accounting. • To study the application of accounting in the general business environment.
	BCA 1205: System analysis and design	<ul style="list-style-type: none"> • Define and use common System Analysis and Design fundamental terminology. • Utilize current Analysis and Design tools to graphically characterize processes and flows in a business system. • Design and create effective Input/Output including Web pages/forms. • Design Logical Databases. • Demonstrate the technical and communication skills required for developing a System's Proposal.
	BCA 1296: Data structure Lab	<ul style="list-style-type: none"> • Implement data structure algorithms. • Write, debug, and execute programs on array, stack, queue, recursion, linked lists,

		tree, and graphs.
	BCA 1297: Financial accounting Lab	<ul style="list-style-type: none"> To get the knowledge of implementation related to financial management and accounting.
3 rd	BCA 2101: Design and analysis of Algorithm	<ul style="list-style-type: none"> Argue the correctness of algorithms using inductive proofs and invariants. Analysis of best, average, and worst-case running times of algorithms using asymptotic analysis. Describe the divide-and-conquer paradigm, and synthesize the algorithms. Derive and solve recurrences describing the performance of divide-and-conquer algorithms. Describe the dynamic-programming paradigm, synthesize dynamic-programming algorithms, and analyse them.
	BCA 2102: System Programming	<ul style="list-style-type: none"> To understand the basics of system programs like editors, compiler, assembler, linker, loader, interpreter, and debugger. Describe the various concepts of assemblers and macroprocessors. To understand the various phases of compiler and compare its working with assembler. To understand how linker and loader create an executable program from an object module created by assembler and compiler. To know various editors and debugging techniques.
	BCA 2103: Computer Oriented Numerical method and Statistical method	<ul style="list-style-type: none"> Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems. Apply numerical methods to obtain approximate solutions to mathematical problems. Derive numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations.

		<ul style="list-style-type: none"> • Analysis and evaluate the accuracy of common numerical methods. • Data analysis using statistical tools.
	BCA 2104: Database Management System	<ul style="list-style-type: none"> • Understand fundamental concepts of database. • Understand user requirements and frame it in data model. • Ability to create, manipulate, and querying of data in databases. • Ability to solve real world problems using appropriate set, function, and relational models. • Ability to design E-R Model for given requirements and convert the same into database tables.
	BCA 2105: Microprocessor	<ul style="list-style-type: none"> • Learn about assembly language programming. • To make the students understand the detailed architecture of microprocessor. • Develop concept of interfacing external devices with microprocessor.
	BCA 2196: DBMS Lab	<ul style="list-style-type: none"> • Gain knowledge of database systems and database management systems software. • Formulate, provide solutions to a broad range of query and data update problems using SQL.
	BCA 2197: Gr. A: Microprocessor Lab (8085) and System Programming lab(8086) Gr. B: Numerical Laboratory	<ul style="list-style-type: none"> • To understand design procedures of different electronic circuits as per requirement. • To build experimental setup and test the circuits. • To develop skills of analysing test results of given experiments.
4 th	BCA 2201: Object Oriented programming using C++	<ul style="list-style-type: none"> • Understand fundamental constructs of OOP. • Get the knowledge of different forms of OOP Implementation. • To demonstrate the differences between traditional imperative design and object-oriented design. • To understand the role of inheritance, polymorphism, dynamic binding and generic structures in building reusable code.
	BCA 2202: Operating System	<ul style="list-style-type: none"> • Learn different types of operating systems along with concept of file systems and CPU scheduling algorithms used in operating system.

		<ul style="list-style-type: none"> • Provide knowledge of memory management and deadlock handling. • Implement various algorithms required for process scheduling, memory management, and resource allocation used in Operating System.
	BCA 2203: Operation Research	<ul style="list-style-type: none"> • Solve linear programming problems using appropriate techniques and optimization solvers, and interpret the results obtained. • Determine optimal strategy for Minimization of Cost of shipping of products from source to Destination/ Maximization of profits of shipping products using various methods, Finding initial basic feasible and optimal solution of the Transportation problems. • Model competitive real-world phenomena using concepts from game theory, and analyse pure and mixed strategy games. • Formulate Network models for service and manufacturing systems, and apply operations research techniques and algorithms to solve the problems.
	BCA 2204: Software Engineering	<ul style="list-style-type: none"> • Select and implement different software development process models. • Define the basic concepts and importance of Software project management concepts • Apply different testing and debugging techniques, and analyse their effectiveness. • Extract and analyse software requirements specifications for different projects.
	BCA 2205: Computer Network	<ul style="list-style-type: none"> • Explain the role of protocols in networking and understand the services and features of various layers in the protocol stack. • Understand the concepts of topology, transmission media, error control, flow control, routing, socket programming, WWW, HTTP, DNS, etc. • Familiar with the devices like repeaters, bridges, switches, routers, gateways, and quality of service.
	BCA 2296: C++ Lab	<ul style="list-style-type: none"> • Ability to write, debug, and execute programs based on object oriented programming.
	BCA 2297: Operating system lab & Network lab	<ul style="list-style-type: none"> • Simulation of CPU Scheduling Algorithms. (FCFS, RR, SJF, Priority, Multilevel Queuing). Simulation of Banker's Algorithm for Deadlock Avoidance, Prevention Program for FIFO,

		<p>LRU, and OPTIMAL page replacement algorithm.</p> <ul style="list-style-type: none"> • Implementation of socket programming in UDP and TCP.
5 th	BCA 3101: OOPS using JAVA	<ul style="list-style-type: none"> • Understand the principles and practice of object oriented analysis and design in the construction of robust, maintainable programs which satisfy their requirements. • Understand the concept of package, interface, multithreading and File handling in java. • Implement, compile, test and run Java programs comprising more than one class, to address a particular problem.
	BCA 3102: Profession Values and Ethics	<ul style="list-style-type: none"> • Identify the multiple ethical interests at stake in a real-world situation or practice • Articulate what makes a particular course of action ethically defensible. • Assess the ethical values and the social context of problems. • Identify ethical concerns in industry, academics, research and intellectual contexts.
	BCA 3103: .(dot)NET Technology	<ul style="list-style-type: none"> • Understand the basic concepts of .NET programming issues. • Understand the basic concepts of .NET statements. • Acquire detailed knowledge on implementing web applications. • Acquire the detailed knowledge Navigation controls. • Apply and work with Database.
	BCA 3104: Automata theory/ Web Design and Application (Elective I)	<p>Automata theory:</p> <ul style="list-style-type: none"> • Learn about Automata theory and its application in Language Design. • Discuss key notions of computation, such as algorithm, computability, decidability, reducibility, and complexity, through problem solving. • Solve computational problems regarding their computability and complexity and prove the basic results of the theory of computation. <p>Web Design and Application:</p> <ul style="list-style-type: none"> • Understand the basics of Internet. • Able to design static and dynamic web pages. • Understand the phases of Planning and Building Web Sites.

	BCA 3195: Seminar	<ul style="list-style-type: none"> • Develop skills in presentation and discussion of research topics in a public forum. • Exposure to a variety of emerging technologies and research activities in order to enrich their experience.
	BCA 3196: JAVA lab	<ul style="list-style-type: none"> • Implement, compile, test and run Java programs. • Understand the concept of package, interface, multithreading and File handling.
	BCA 3197: .NET lab	<ul style="list-style-type: none"> • Create user interactive web pages using ASP.Net. • Create simple data binding applications using ADO.Net connectivity. • Performing Database operations for Windows Form and web applications.
6 th	BCA 3201: OOAD using UML	<ul style="list-style-type: none"> • Understand fundamental constructs of OOP. • Get the knowledge of UML with skills to draw UML diagrams. • Get the knowledge of different forms of OO Implementation • Develop applications using Object Oriented Programming Concepts.
	BCA 3202: E – Commerce & ERP (Elective-II)	<ul style="list-style-type: none"> • Understand the basic concepts and technologies used in the field of e-commerce applications and management information systems. • Gain the knowledge of the different types of e-commerce applications and management information systems. • Understand the processes of developing and implementing information systems. • Be aware of the ethical, social, and security issues of e-commerce and information systems.
	BCA 3203: Computer graphics and multimedia	<ul style="list-style-type: none"> • Provide comprehensive introduction about computer graphics system. • Understand 2d transformations. • Familiar with techniques of clipping, 3D graphics and 3D transformations. • Familiar with animations.
	BCA 3294: Graphics and multimedia lab	<ul style="list-style-type: none"> • Understand the practical implementation of modelling, rendering, and viewing objects in 2D.

		<ul style="list-style-type: none">• Understand the concepts of different type of geometric transformation of objects in 2D and 3D.• Apply clipping and filling techniques for modifying an object.• Design scan conversion problems.
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